**FIG. 1**

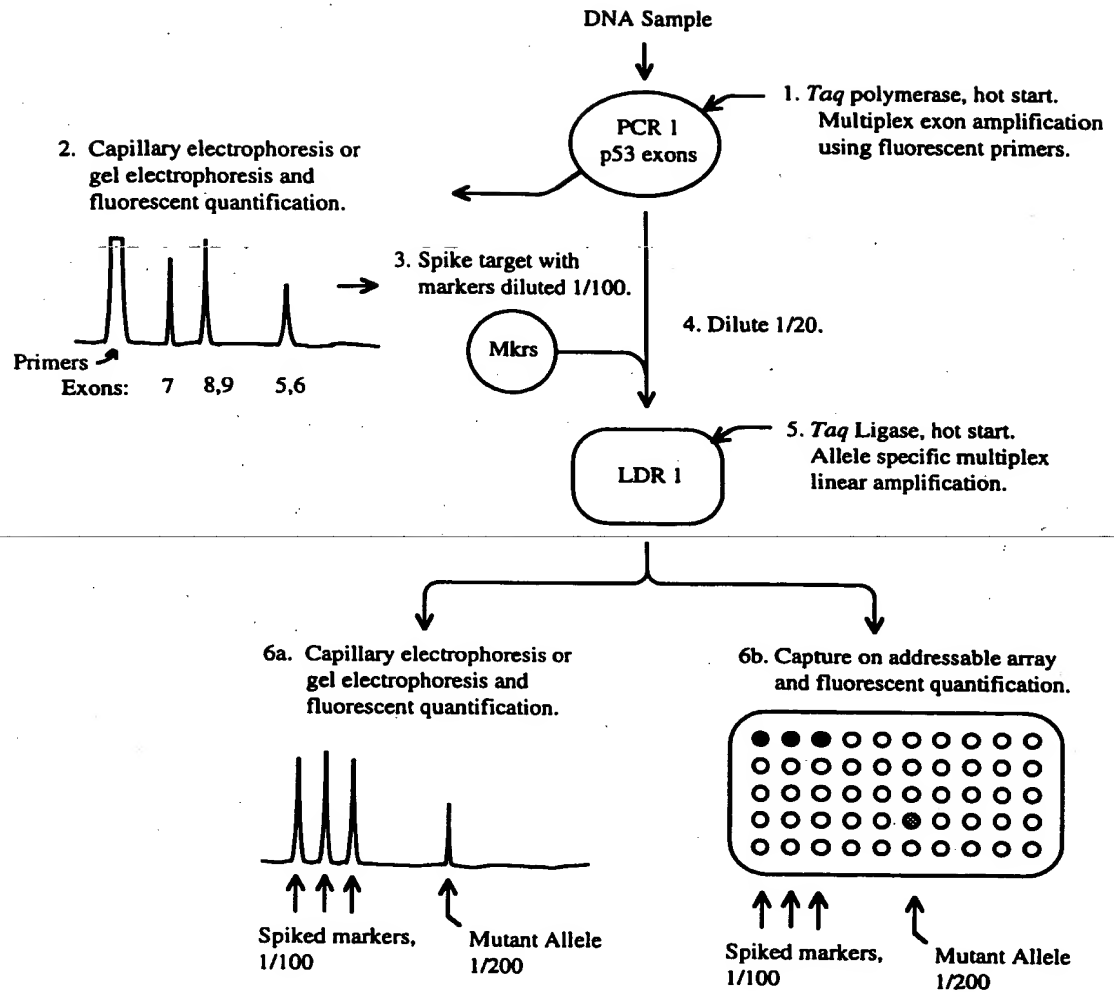
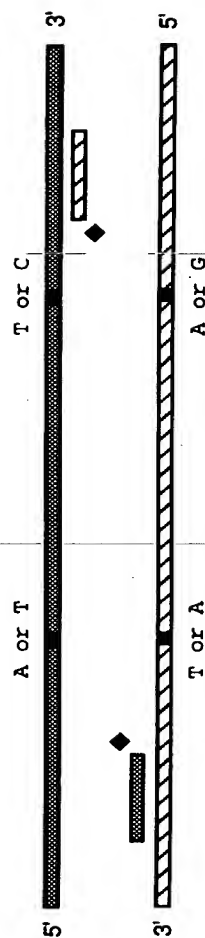


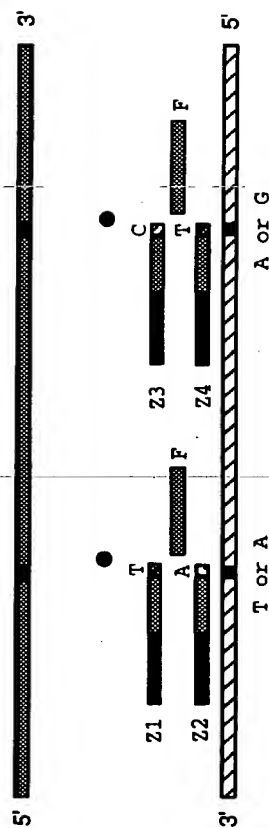
FIG. 2

PCR/LDR

1. PCR amplify region(s) containing mutations using primers, dNTPs and *Taq* polymerase. ◆



2. Perform LDR using allele-specific LDR primers and thermostable ligase. ●
Allele specific oligonucleotides ligate to common oligonucleotides only when there is perfect complementarity at the junction.



3. Capture fluorescent products on addressable array and quantify each allele.

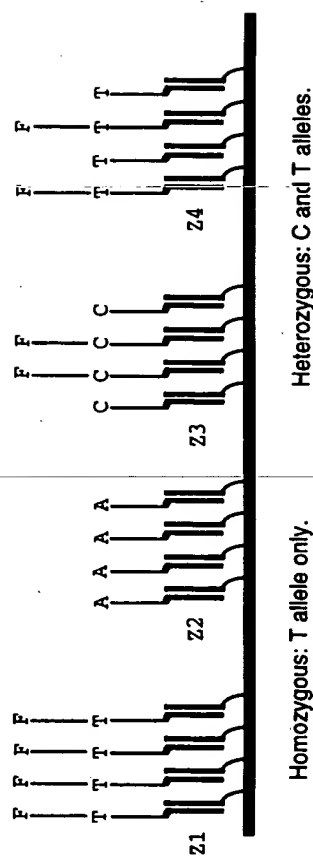
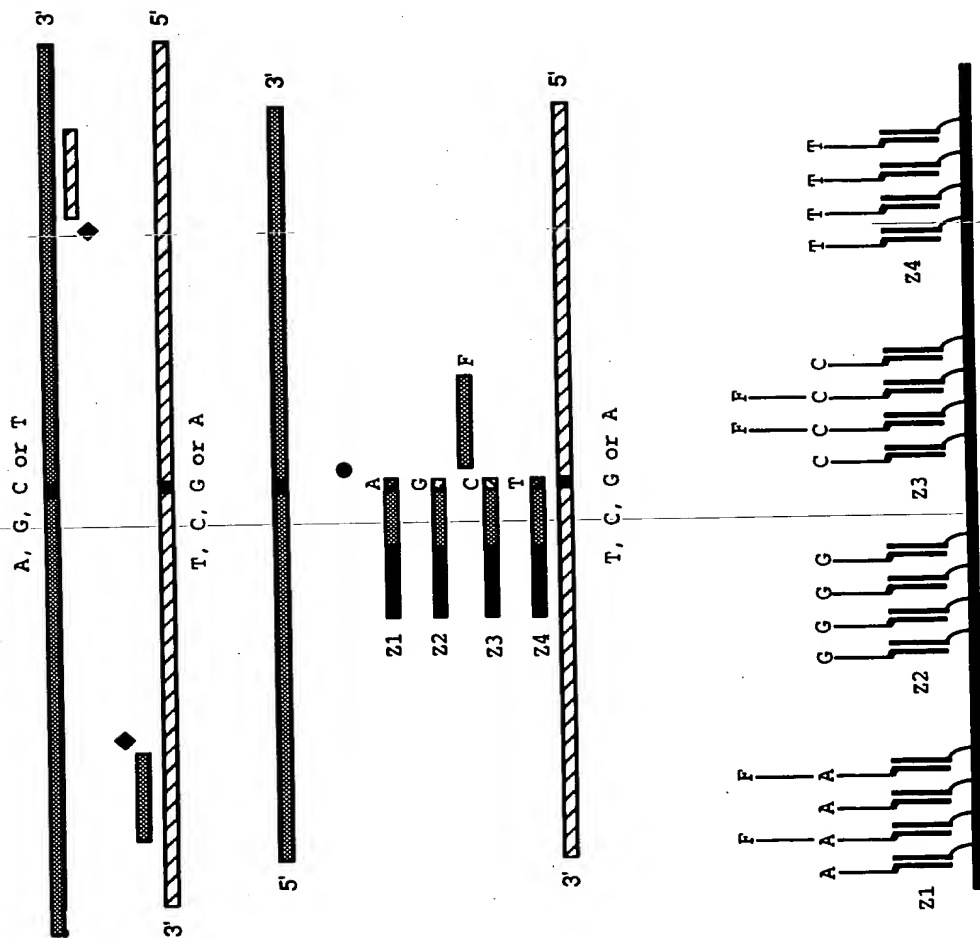


FIG. 3

PCR/ LDR

1. PCR amplify region(s) containing mutations using primers, dNTPs and *Taq* polymerase. ♦
2. Perform LDR using allele-specific LDR primers and thermostable ligase. ●
Allele specific oligonucleotides ligate to common oligonucleotides only when there is perfect complementarity at the junction.
3. Capture fluorescent products on addressable array and quantify each allele.

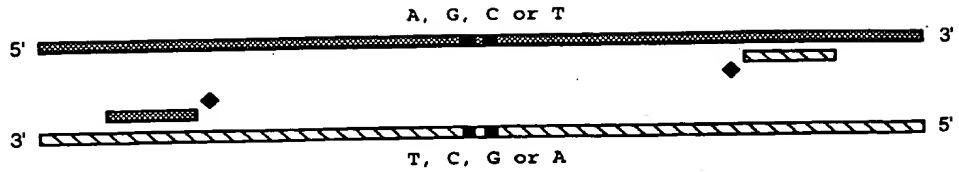


Heterozygous: A and C alleles.

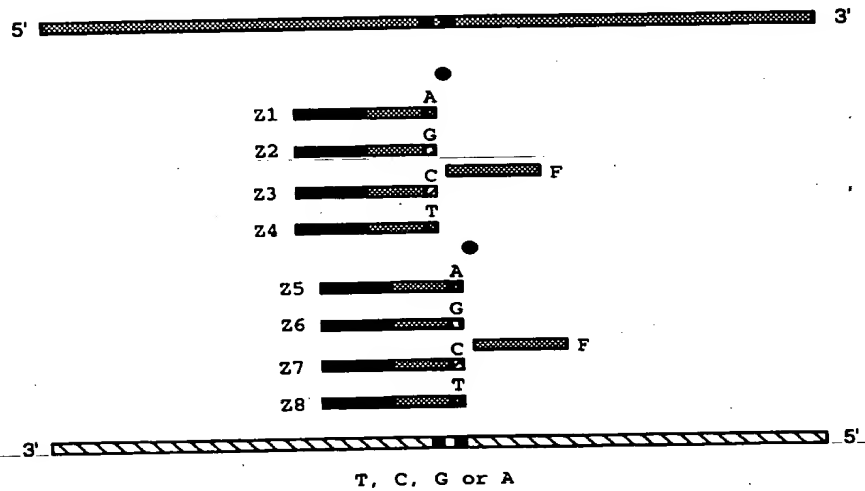
FIG. 4

PCR/ LDR : Nearby alleles

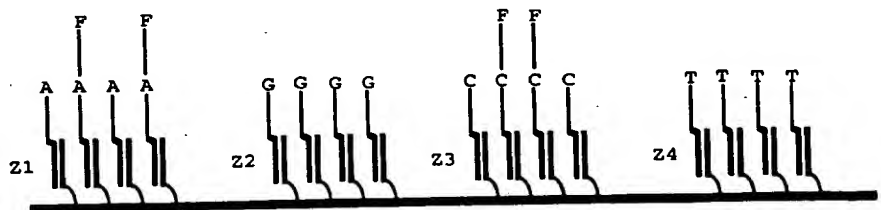
1. PCR amplify region(s) containing mutations using primers, dNTPs and *Taq* polymerase. ♦



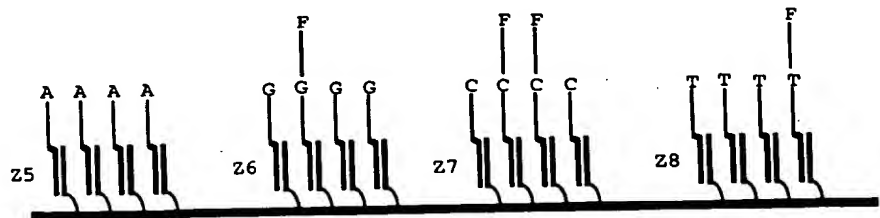
2. Perform LDR using allele-specific LDR primers and thermostable ligase. ●
Allele specific oligonucleotides ligate to common oligonucleotides only when there is perfect complementarity at the junction.



3. Capture fluorescent products on addressable array and quantify each allele.



Heterozygous: A and C alleles.

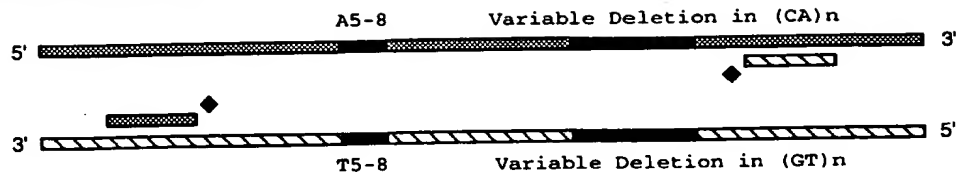


Heterozygous: G,C, and T alleles.

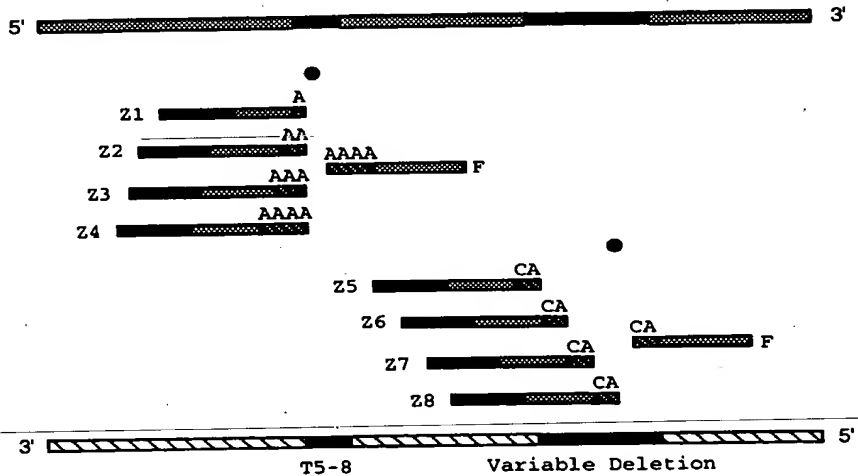
FIG. 5

PCR/ LDR : Insertions and Deletions

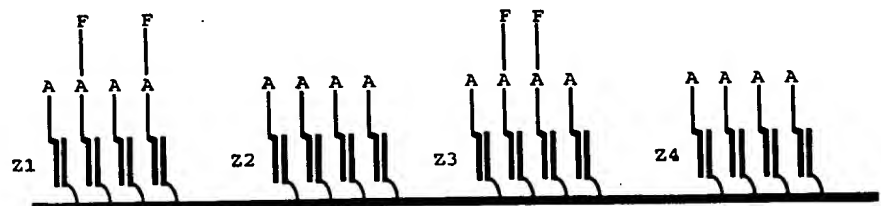
1. PCR amplify region(s) containing mutations using primers, dNTPs and Taq polymerase. ◆



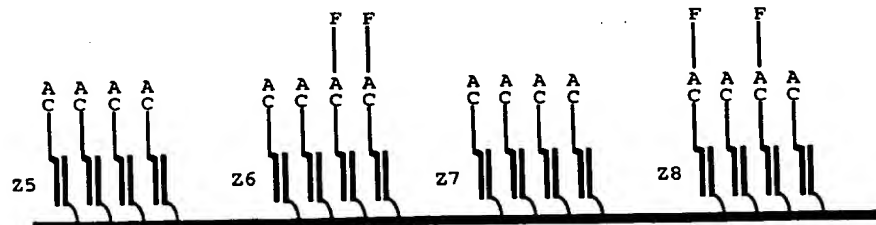
2. Perform LDR using allele-specific LDR primers and thermostable ligase. ●
 Allele specific oligonucleotides ligate to common oligonucleotides only when there is perfect complementarity at the junction.



3. Capture fluorescent products on addressable array and quantify each allele.



Heterozygous: A5 and A7 alleles.

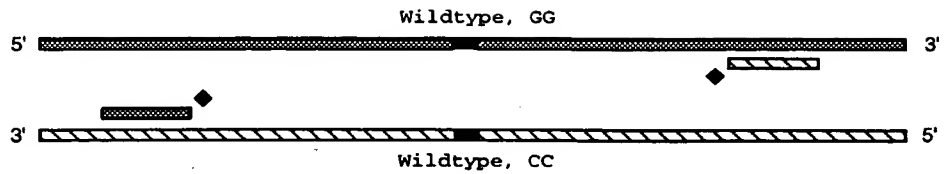


Heterozygous: (CA)5 and (CA)3 alleles.

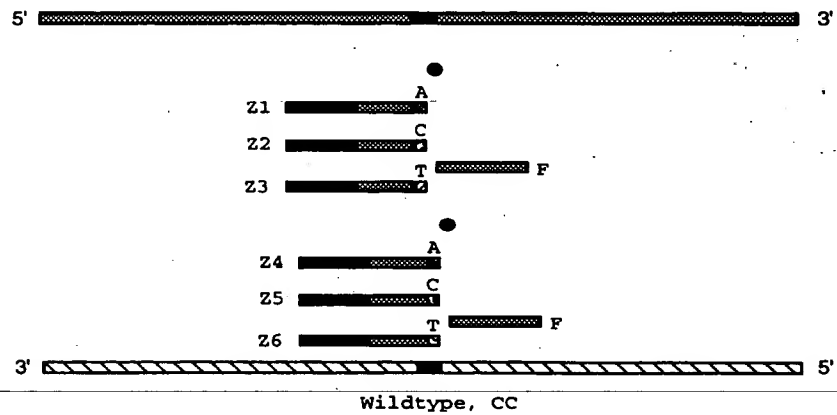
FIG. 6

PCR/ LDR : Adjacent alleles, cancer detection

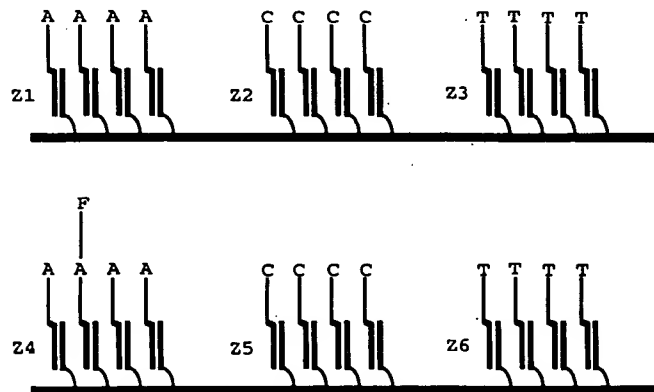
1. PCR amplify region(s) containing mutations using primers, dNTPs and *Taq* polymerase. ◆



2. Perform LDR using allele-specific LDR primers and thermostable ligase. ●
Allele specific oligonucleotides ligate to common oligonucleotides only when there is perfect complementarity at the junction.



3. Capture fluorescent products on addressable array and quantify each allele.

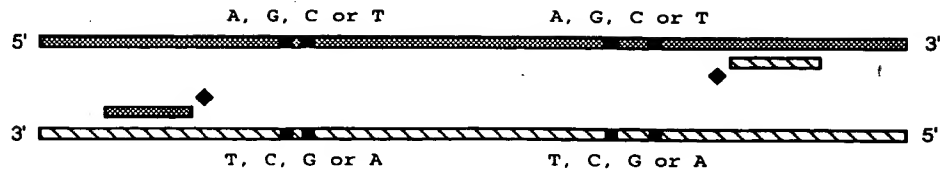


Gly to Asp mutation

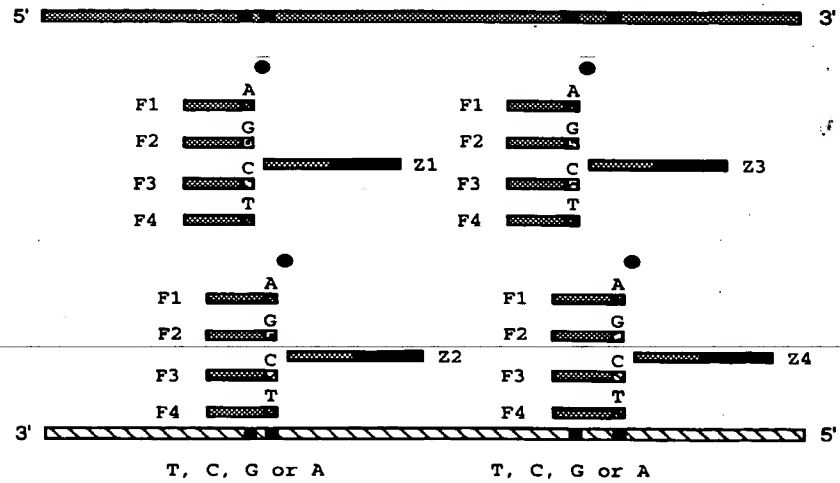
FIG. 7

PCR/ LDR : Nearby alleles

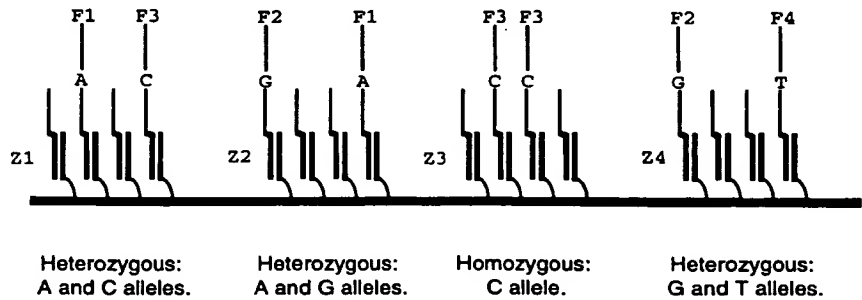
1. PCR amplify region(s) containing mutations using primers, dNTPs and *Taq* polymerase. ♦



2. Perform LDR using allele-specific LDR primers and thermostable ligase. ●
 Allele specific oligonucleotides ligate to common oligonucleotides only when there is perfect complementarity at the junction.

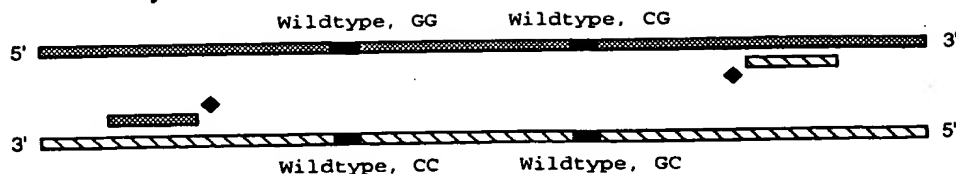


3. Capture fluorescent products on addressable array and quantify each allele.

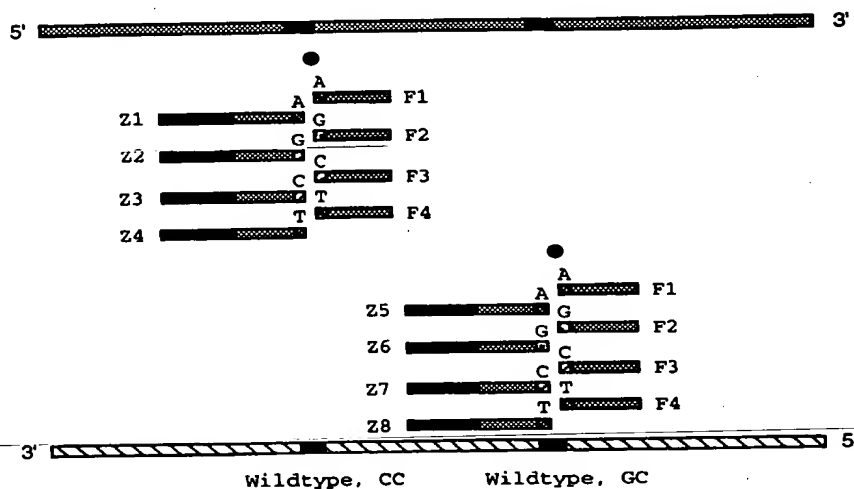
**FIG. 8**

PCR/ LDR : Adjacent and Nearby alleles

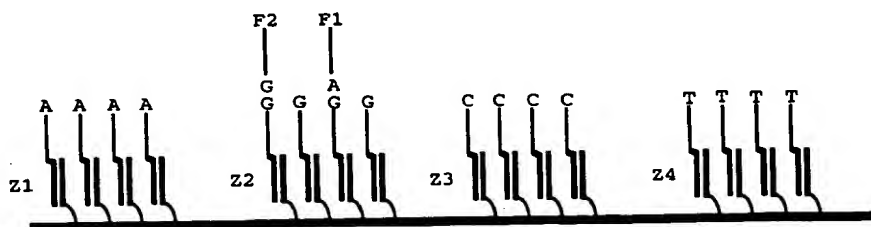
1. PCR amplify region(s) containing mutations using primers, dNTPs and *Taq* polymerase. ◆



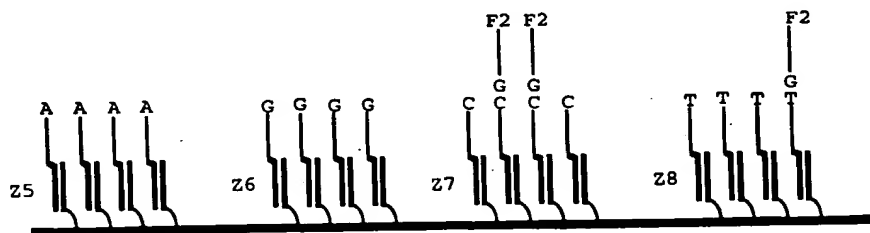
2. Perform LDR using allele-specific LDR primers and thermostable ligase. ●
Allele specific oligonucleotides ligate to common oligonucleotides only when there is perfect complementarity at the junction.



3. Capture fluorescent products on addressable array and quantify each allele.



Heterozygous: Gly and Glu alleles.



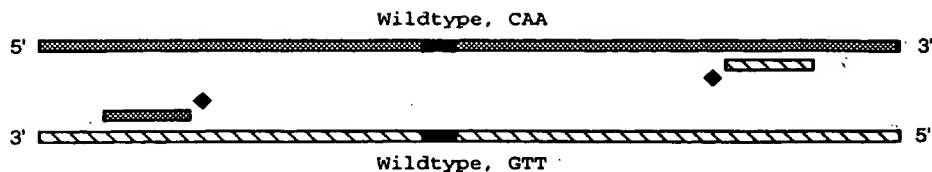
Heterozygous: Arg and Trp alleles.

FIG. 9

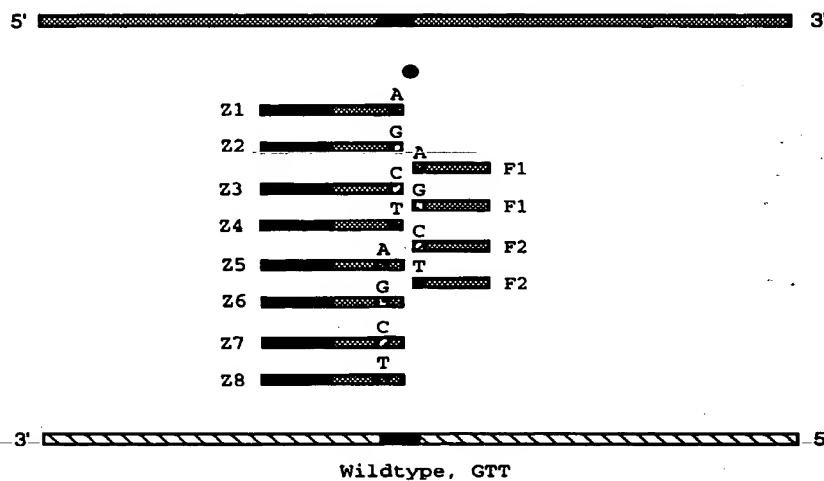
10/34

PCR/ LDR : All alleles of a single codon

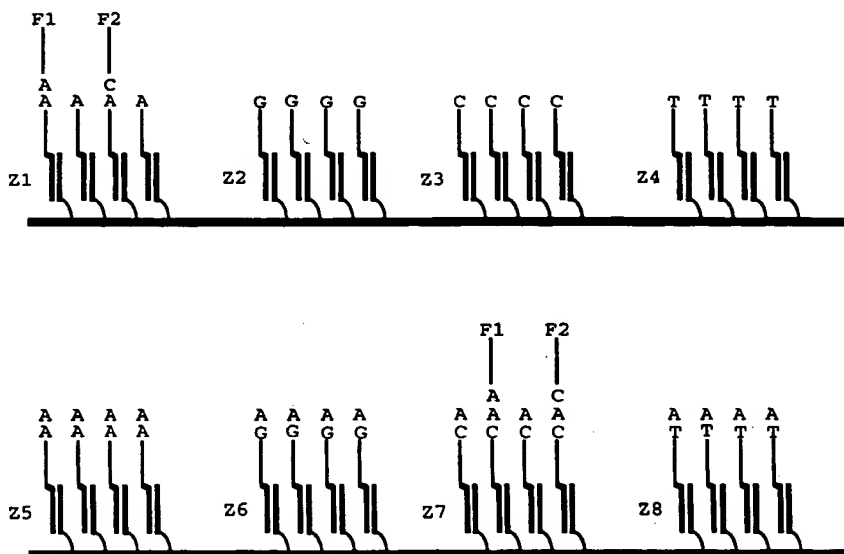
1. PCR amplify region(s) containing mutations using primers, dNTPs and *Taq* polymerase. ◆



2. Perform LDR using allele-specific LDR primers and thermostable ligase. ●
Allele specific oligonucleotides ligate to common oligonucleotides only when there is perfect complementarity at the junction.



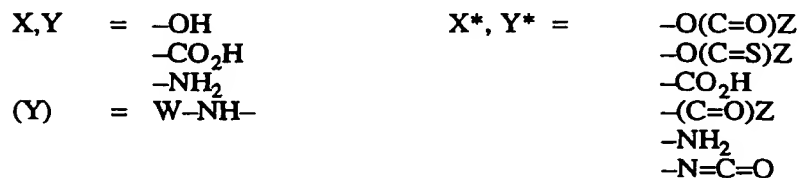
3. Capture fluorescent products on addressable array and quantify each allele.



Heterozygous: Gln and His alleles.

FIG. 10

09986527-10901



Z = activating group, e.g. imidazole (Im), *p*-nitrophenol (OPnp), hydroxysuccinimide (OSu), pentafluorophenol (OPfp)

WSC = water soluble carbodiimide

$$\begin{array}{ll}
 -\text{OH} \rightarrow -\text{O}(\text{CH}_2)_n\text{CO}_2\text{H} & n = 1, 2 \\
 -\text{OH} \rightarrow -\text{O}(\text{C}=\text{O})\text{NHCH}_2\text{CO}_2\text{H} & \\
 -\text{OH} \rightarrow -\text{O}(\text{C}=\text{O})\text{CH}_2\text{NH}_2 & \\
 -\text{OH} \rightarrow -\text{O}(\text{C}=\text{O})\text{Im} & \\
 -\text{OH} \rightarrow -\text{O}(\text{C}=\text{S})\text{SCH}_2(\text{C}=\text{O})\text{NH}_2 & \\
 -\text{CO}_2\text{H} \rightarrow -(\text{C}=\text{O})\text{NH}(\text{CH}_2)_n\text{NH}_2 & n = 2, 6 \\
 -\text{CO}_2\text{H} \rightarrow -(\text{C}=\text{O})\text{Z} & \\
 -\text{NH}_2 \rightarrow -\text{NH}(\text{C}=\text{O})(\text{CH}_2)_n\text{CO}_2\text{H} & n = 2, 3
 \end{array}$$

Covalent linkage, $X^* + Y^*$

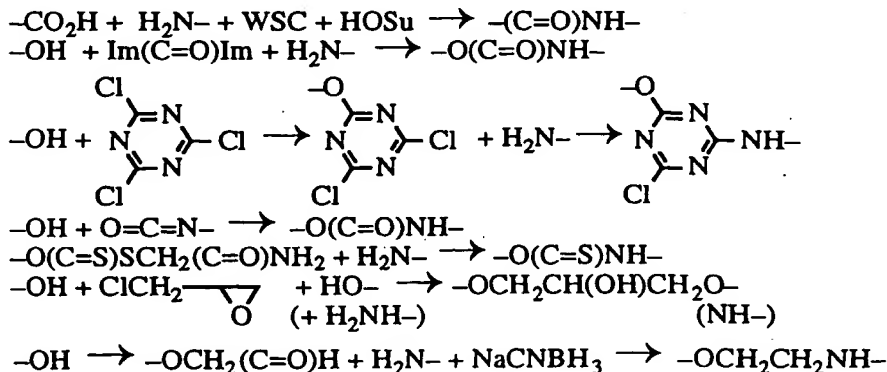
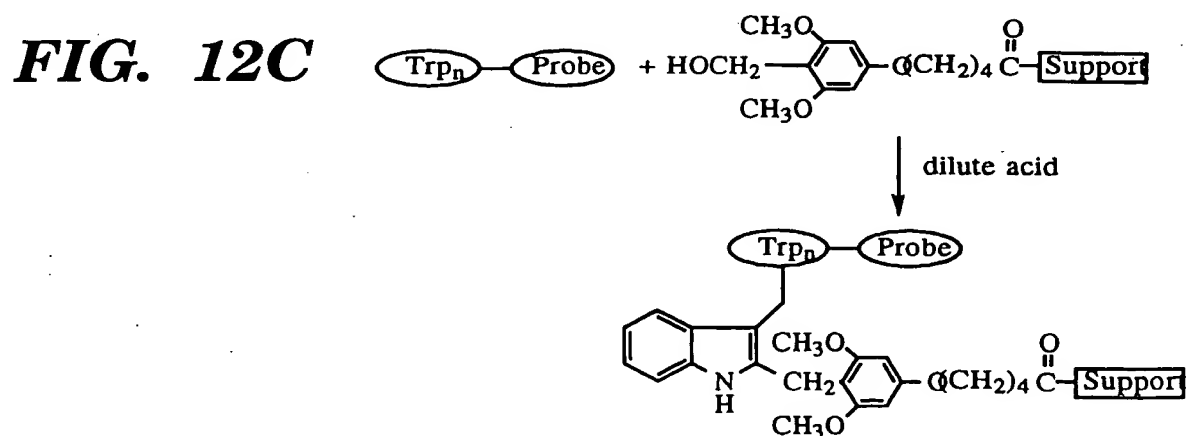
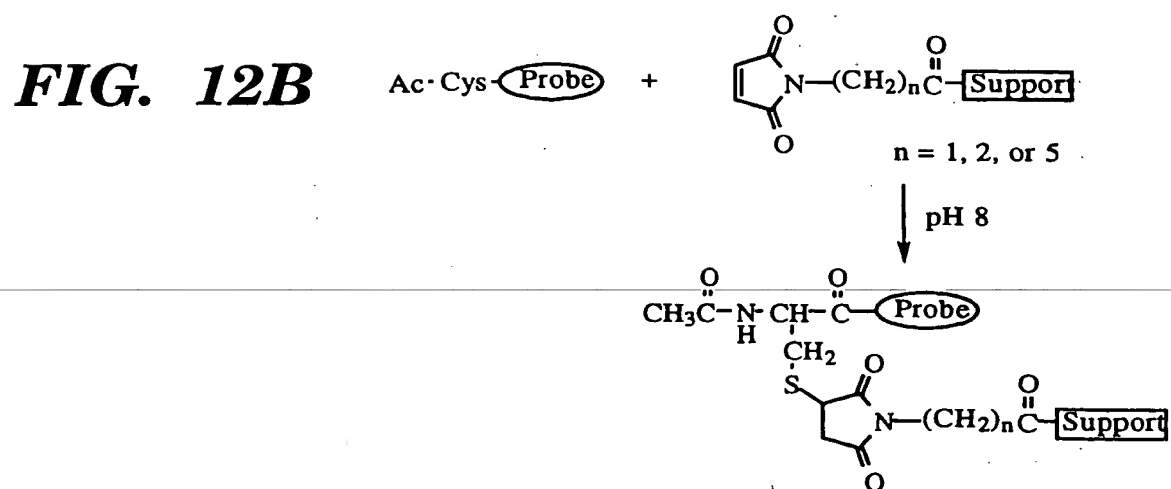
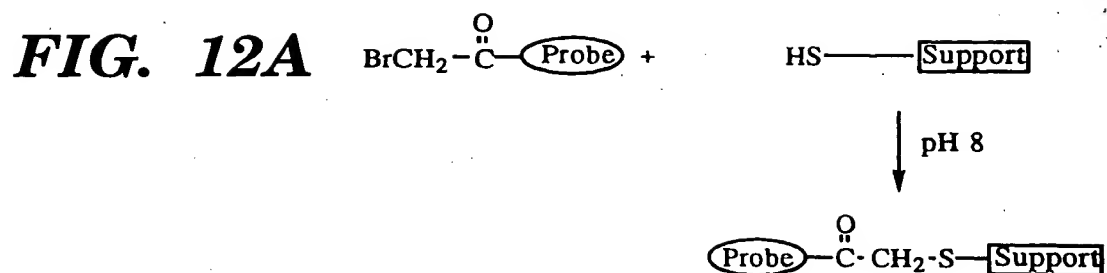


FIG. 11



13/34

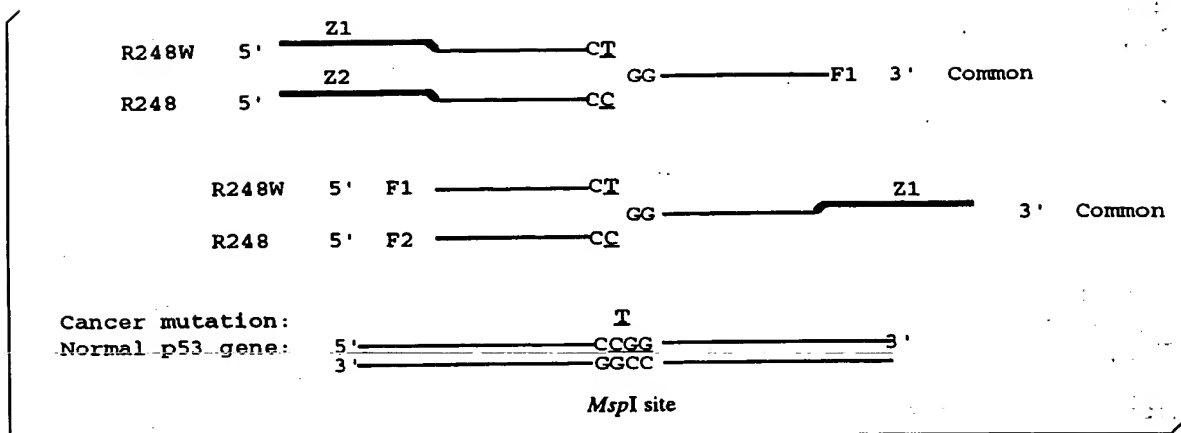


FIG. 13A

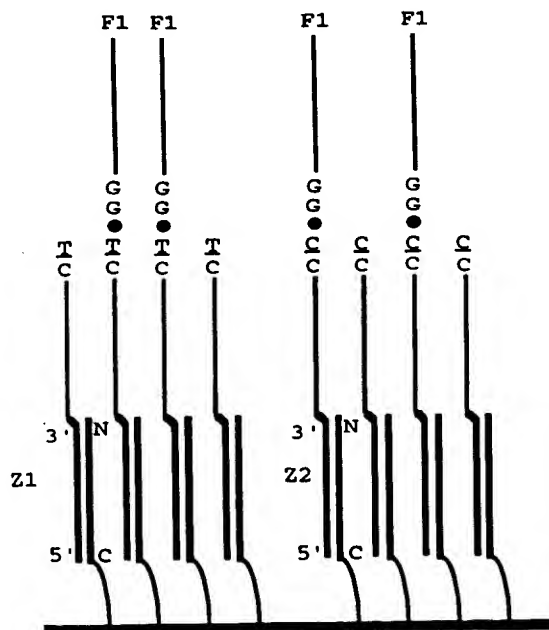


FIG. 13B

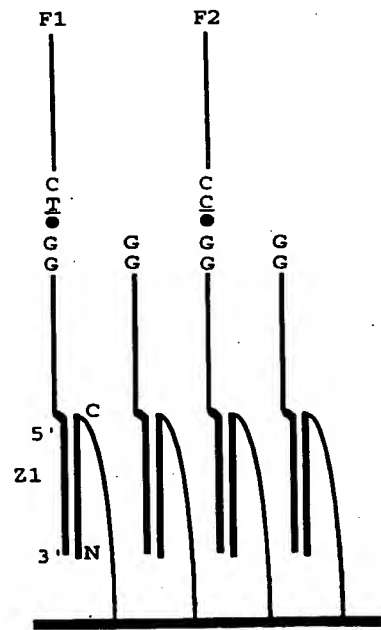


FIG. 13C

09986527-110904

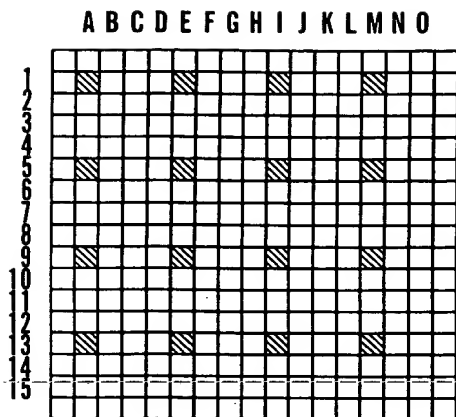


FIG. 14A

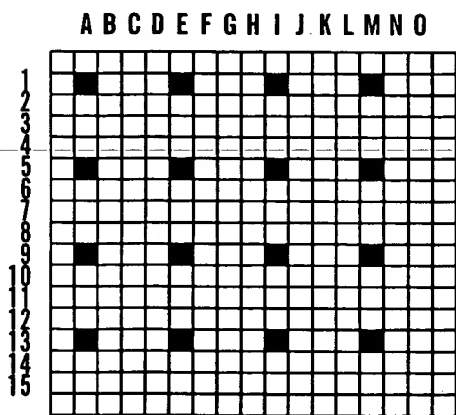


FIG. 14B

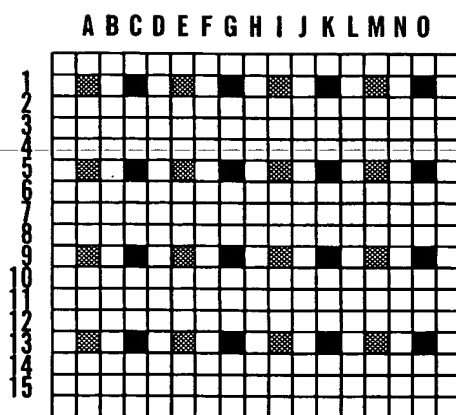


FIG. 14C

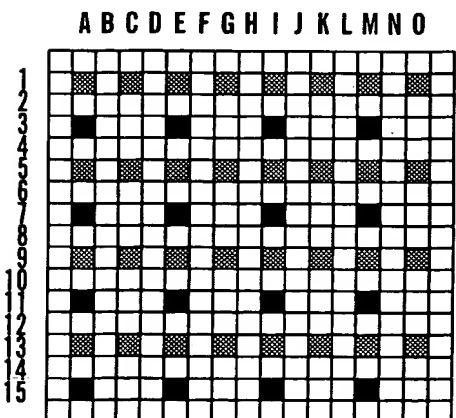


FIG. 14D

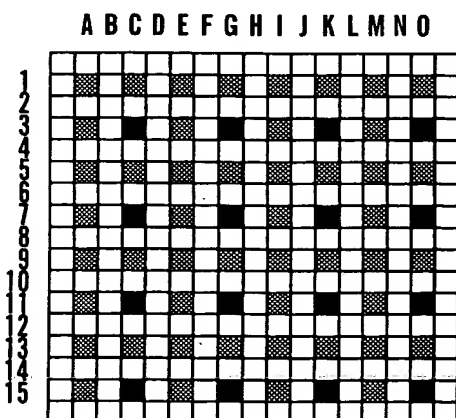


FIG. 14E

FIG. 15A

1st addition of unique 24mers.

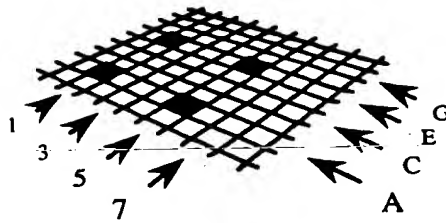


FIG. 15B

2nd addition of unique 24mers.

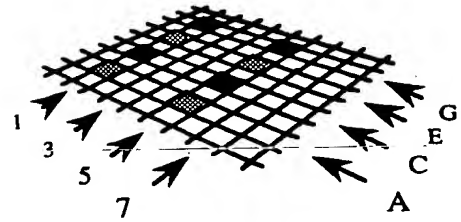


FIG. 15C

3rd addition of unique 24mers.

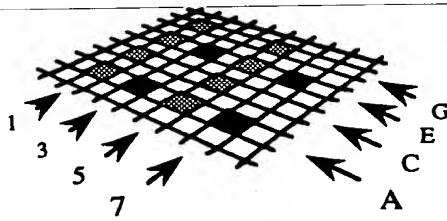


FIG. 15D

4th addition of unique 24mers.

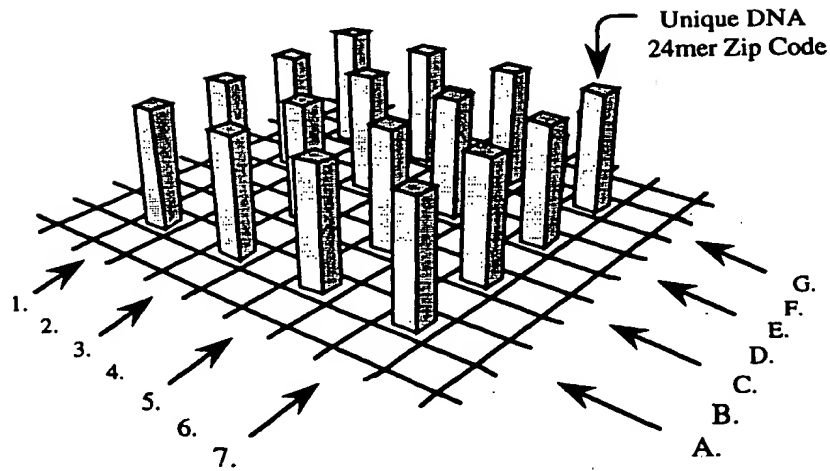
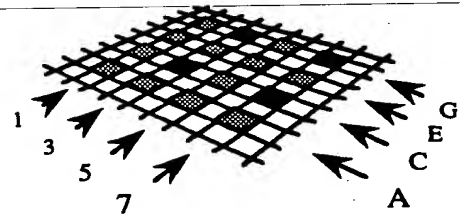
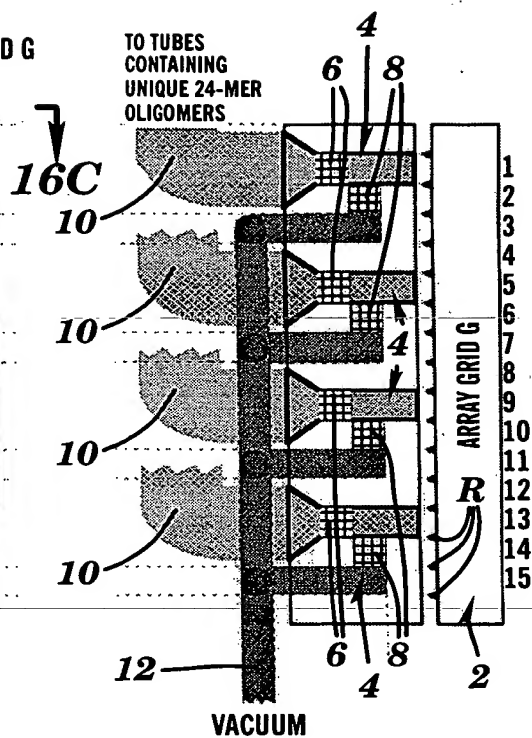
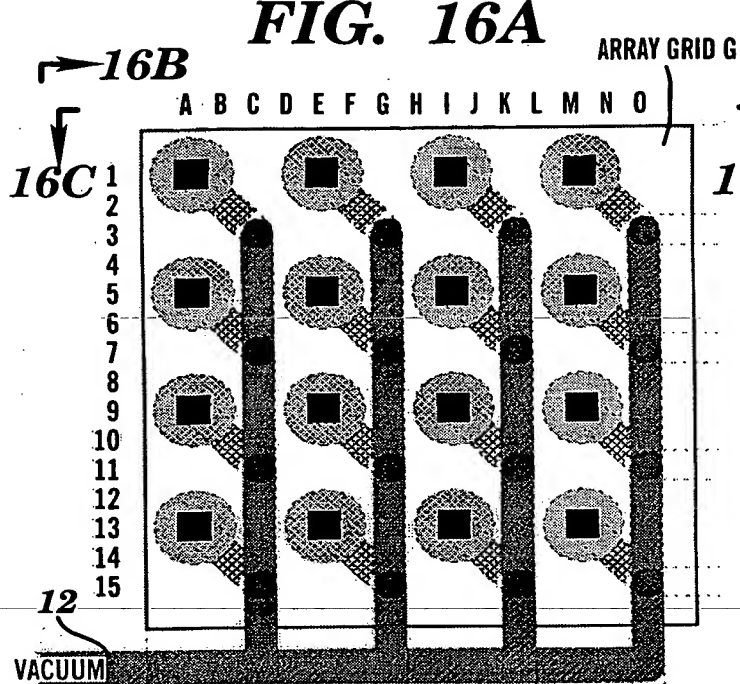
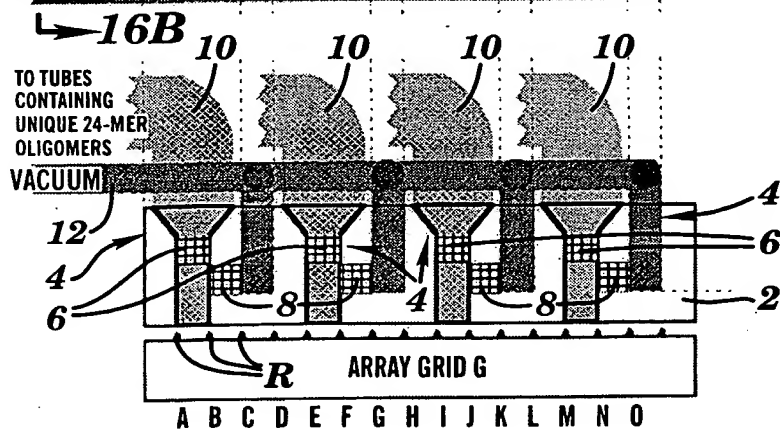


FIG. 15E

FIG. 16A**FIG. 16B****FIG. 16C**

17/34

1ST TWO BASES → 2ND TWO BASES

	TT	TC	TG	TA	CT	CC	CG	CA	GT	GC	GG	GA	AT	AC	AG	AA
TT							16'			23'		TTGA 6			TTAG 8	
TC			TCTG 1		30'	TCCC 3			TCGT 5							5'
TG		TGTC 2		36'			TGCG 4						TGAT 7		11'	
TA						18'		TACA 36			33'					
CT	32'		CTTG 9					CTCA 11	CTGT 13							8'
CC				CCTA 33					29'				CCAT 15			
CG	CGTT 10		12'					4'					28'			CGAA 16
CA		34'			25'		CAGC 12			CAGC 14		1'			9'	
GT					GTCT 19	24'				GTGC 22			31'			
GC	CGTT 17		14'											22'		GCAA 23
GG		20'		GGTA 18	35'							3'		GGAC 24		
GA			GATG 34			GACC 20		2'	GAGT 21							
AT						ATCG 28	7'				15'			ATAC 31		
AC		21'			ACCT 27					ACGG 29	5'				13'	
AG			AGTG 25			AGCC 35			27'			AGGA 30		19'		
AA		AATC 26					10'			17'					AAAG 32	

FIG. 17

09986527-110901

FIG. 18G

1st Tetramer addition
(columns)

1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5

FIG. 18A

18/34

2nd Tetramer addition
(rows)

6	6	6	6	6
5	5	5	5	5
4	4	4	4	4
3	3	3	3	3
2	2	2	2	2

FIG. 18B

3rd Tetramer addition
(columns)

3	4	5	6	1
3	4	5	6	1
3	4	5	6	1
3	4	5	6	1
3	4	5	6	1

FIG. 18C

4th Tetramer addition
(rows)

2	2	2	2	2
1	1	1	1	1
6	6	6	6	6
5	5	5	5	5
4	4	4	4	4

FIG. 18D

5th Tetramer addition
(columns)

6	1	2	3	4
6	1	2	3	4
6	1	2	3	4
6	1	2	3	4
6	1	2	3	4

FIG. 18E

6th Tetramer addition
(rows)

3	3	3	3	3
2	2	2	2	2
1	1	1	1	1
6	6	6	6	6
5	5	5	5	5

FIG. 18F

Addressable array with full length PNA 24mers

1-6-3-2-6-3	2-6-4-2-1-3	3-6-5-2-2-3	4-6-6-2-3-3	5-6-1-2-4-3	
1-5-3-1-6-2	2-5-4-1-1-2	3-5-5-1-2-2	4-5-6-1-3-2	5-5-1-1-4-2	
1-4-3-6-6-1	2-4-4-6-1-1	3-4-5-6-2-1	4-4-6-6-3-1	5-4-1-6-4-1	
1-3-3-5-6-6	2-3-4-5-1-6	3-3-5-5-2-6	4-3-6-5-3-6	5-3-1-5-4-6	
1-2-3-4-6-5	2-2-4-4-1-5	3-2-5-4-2-5	4-2-6-4-3-5	5-2-1-4-4-5	

FIG. 18G

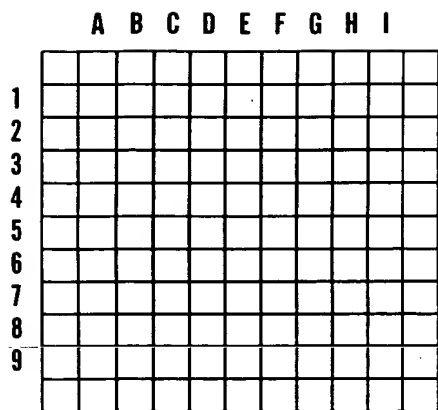


FIG. 19A

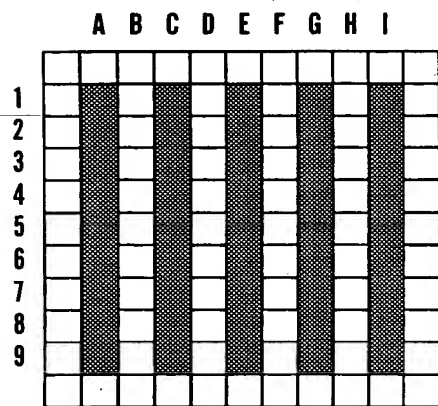


FIG. 19B

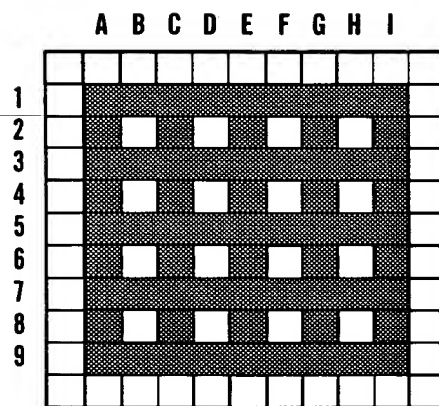


FIG. 19C

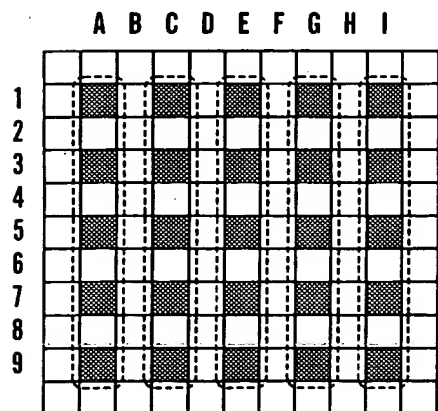


FIG. 19D

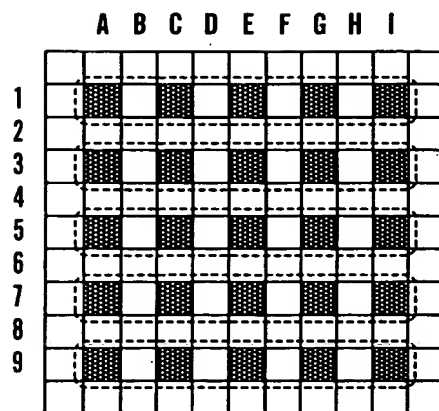
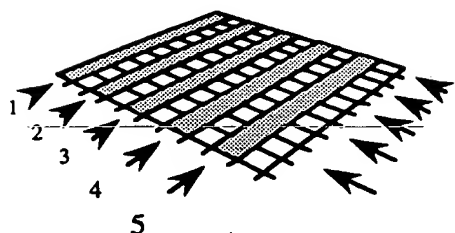
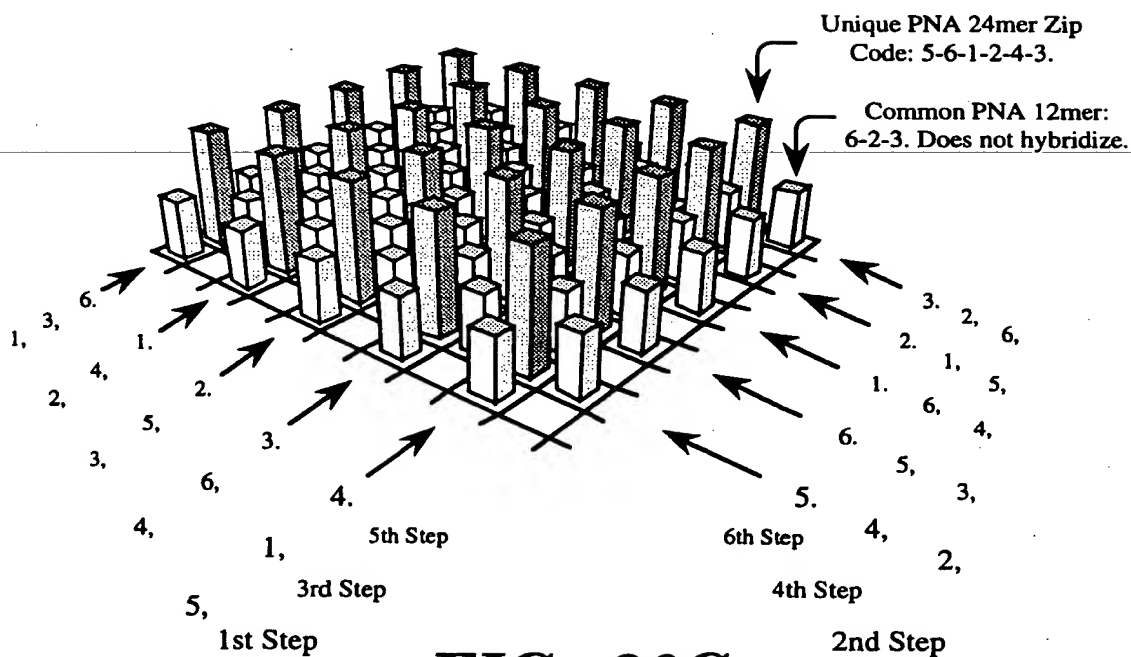
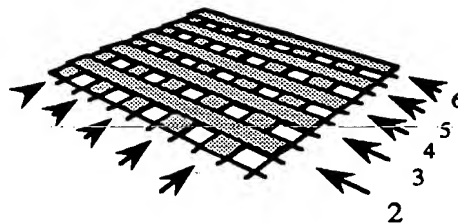
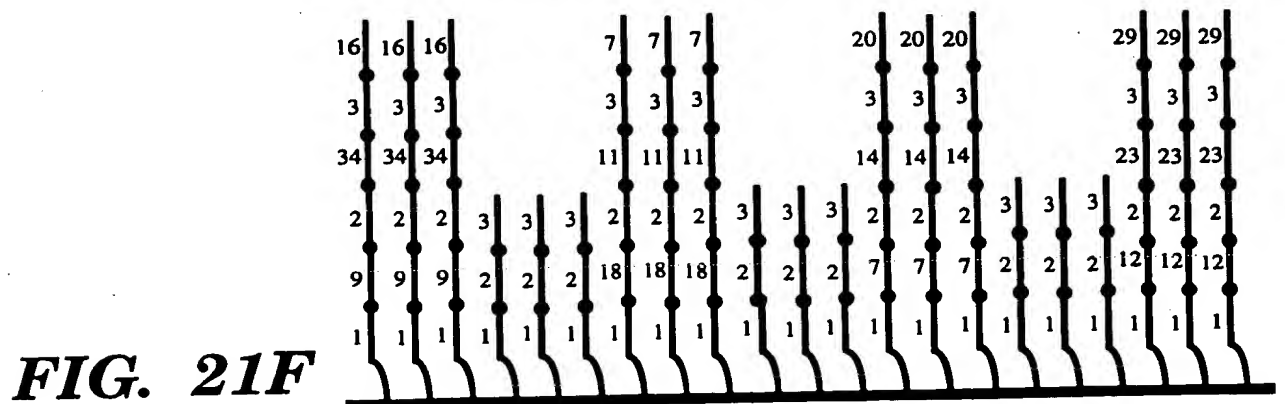
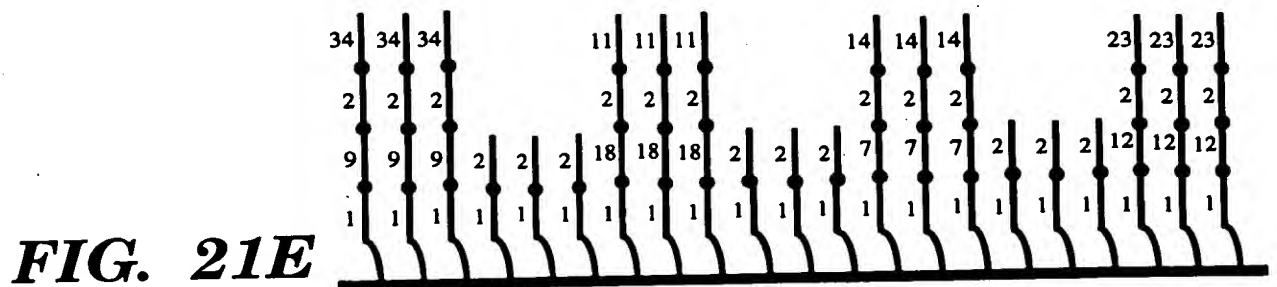
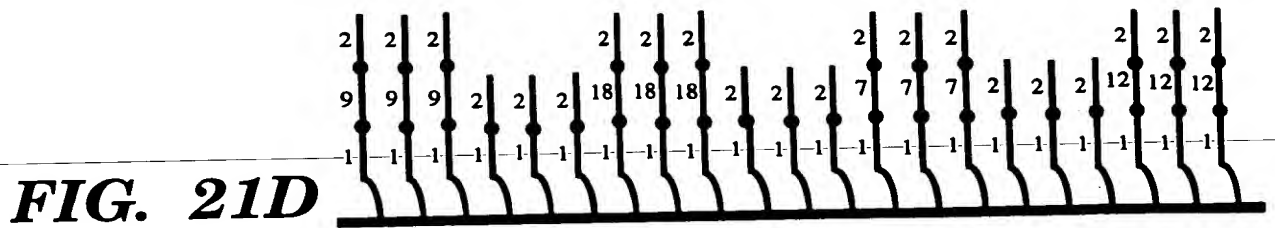
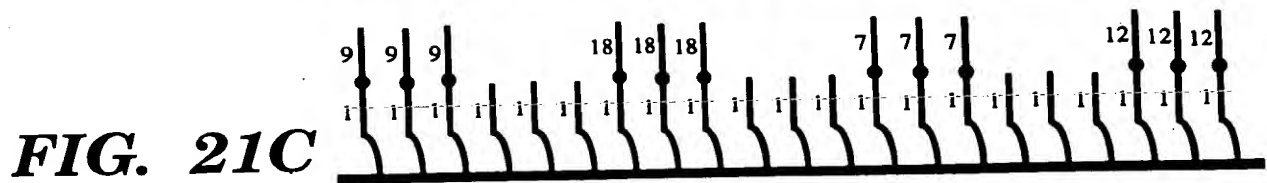
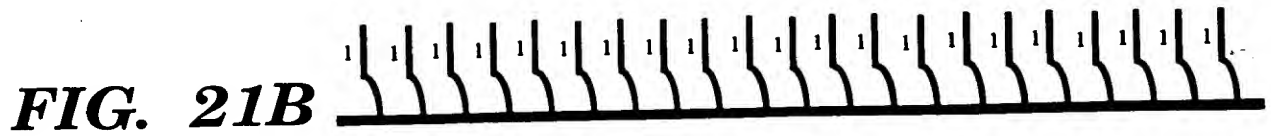
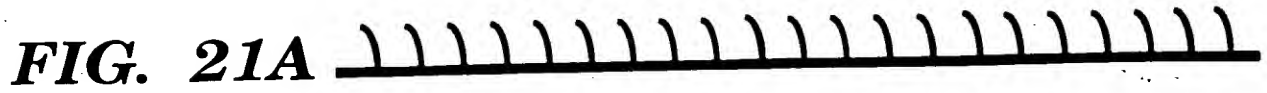


FIG. 19E

09986527-110901

FIG. 20A1st Tetramer additions
(columns)**FIG. 20B**2nd Tetramer additions
(rows)**FIG. 20C**



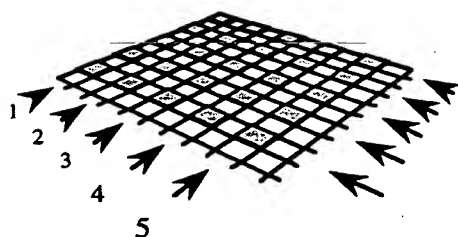
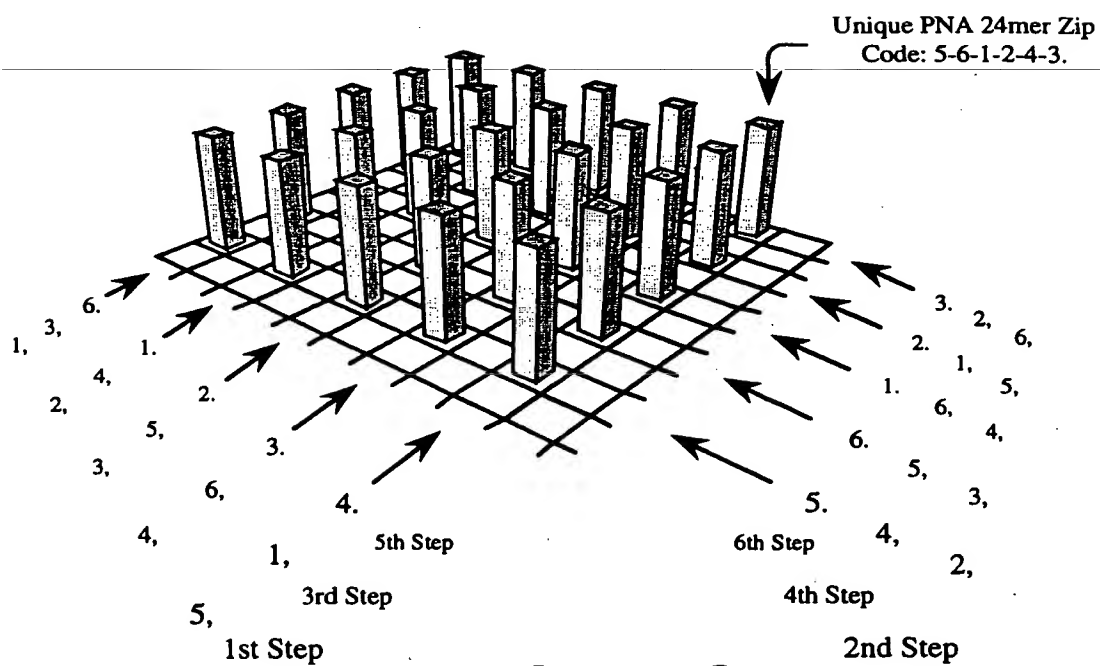
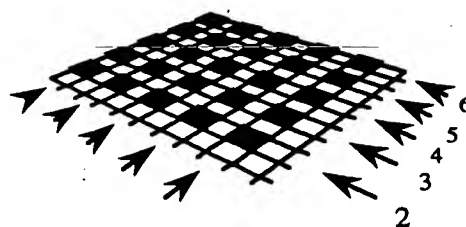
A B C D E F G H I



FIG. 22C



FIG. 22B

FIG. 23A1st Tetramer additions
(columns)**FIG. 23B**2nd Tetramer additions
(rows)**FIG. 23C**

24B FIG. 24A

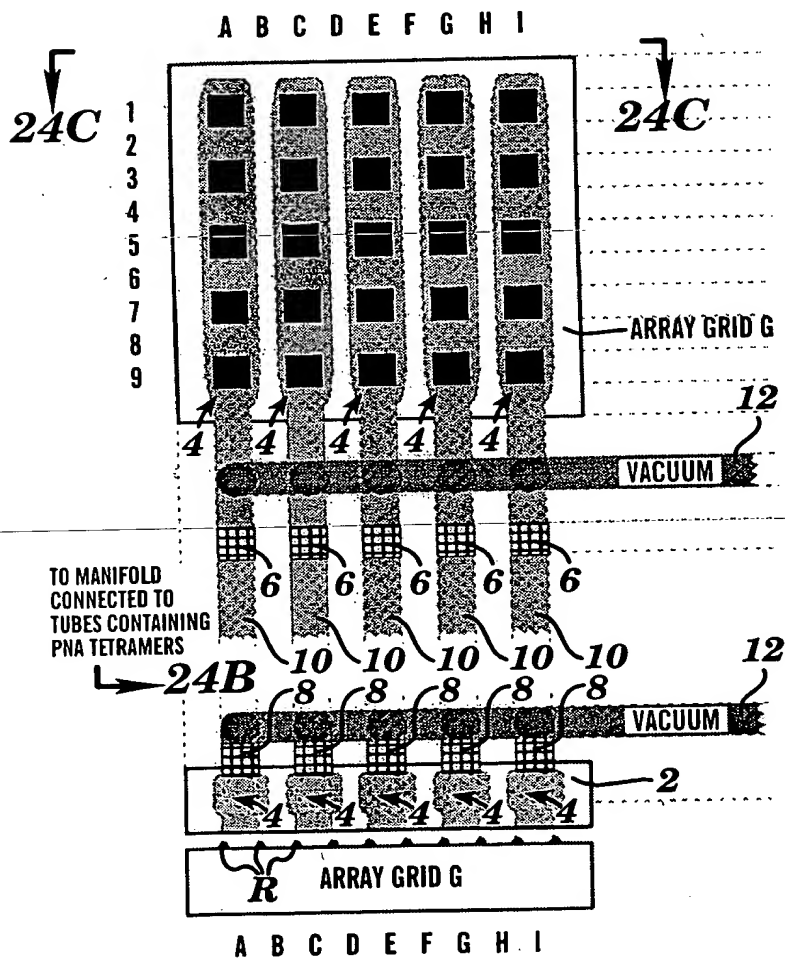


FIG. 24C

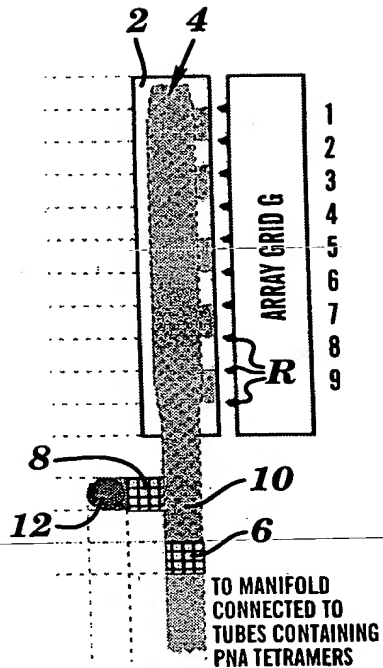


FIG. 24B

09986527 110901

25/34

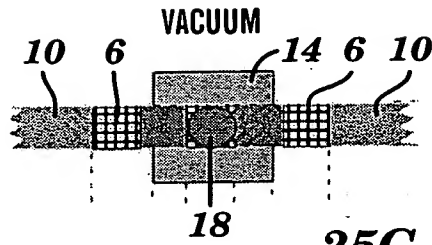


FIG. 25B

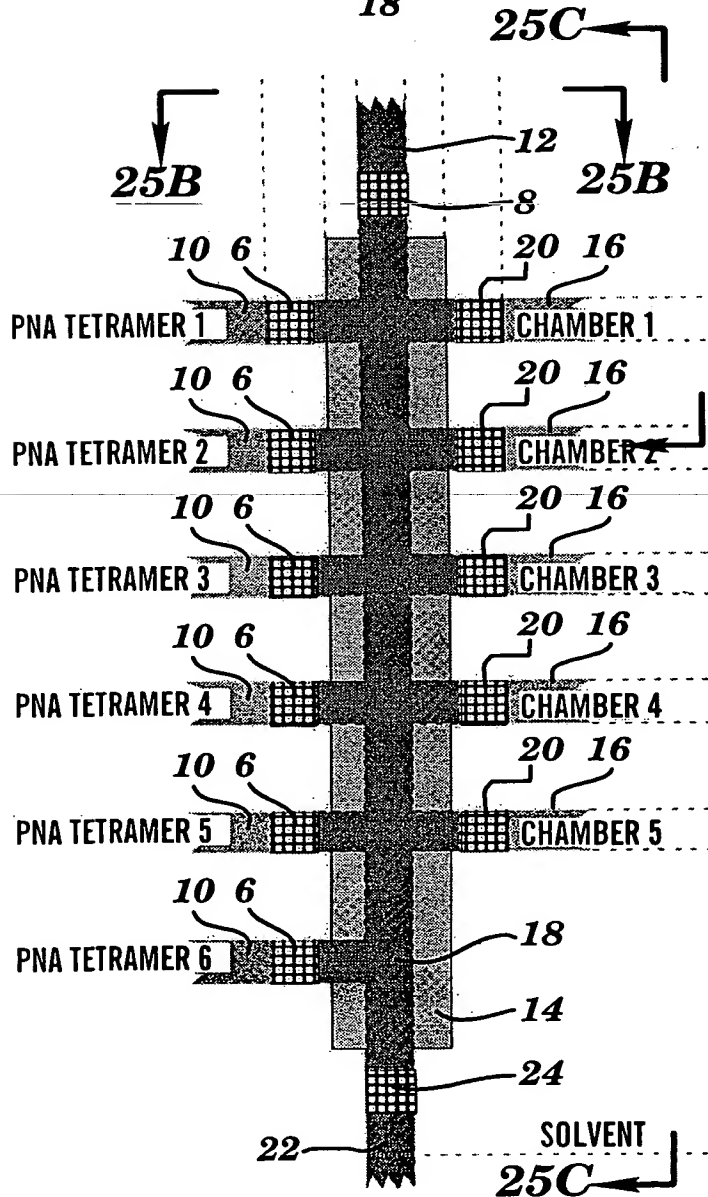


FIG. 25A

VALVE BLOCK
ASSEMBLY

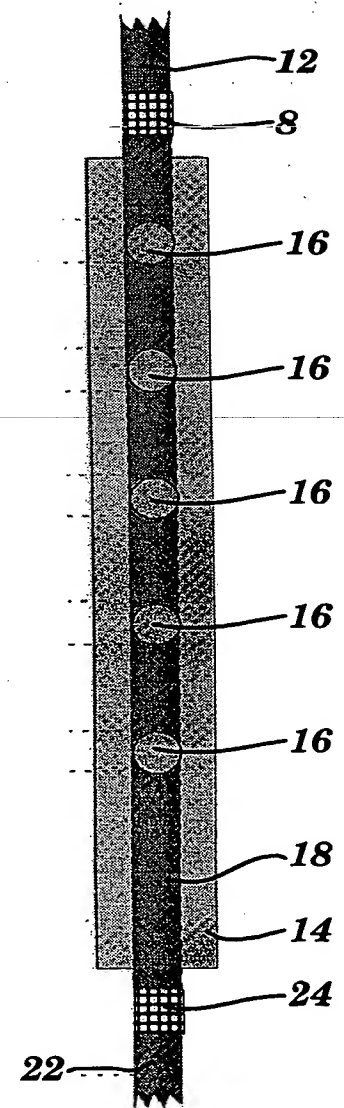


FIG. 25C

6 INPUTS AND 5 OUTPUTS

FIG. 26A 26/34

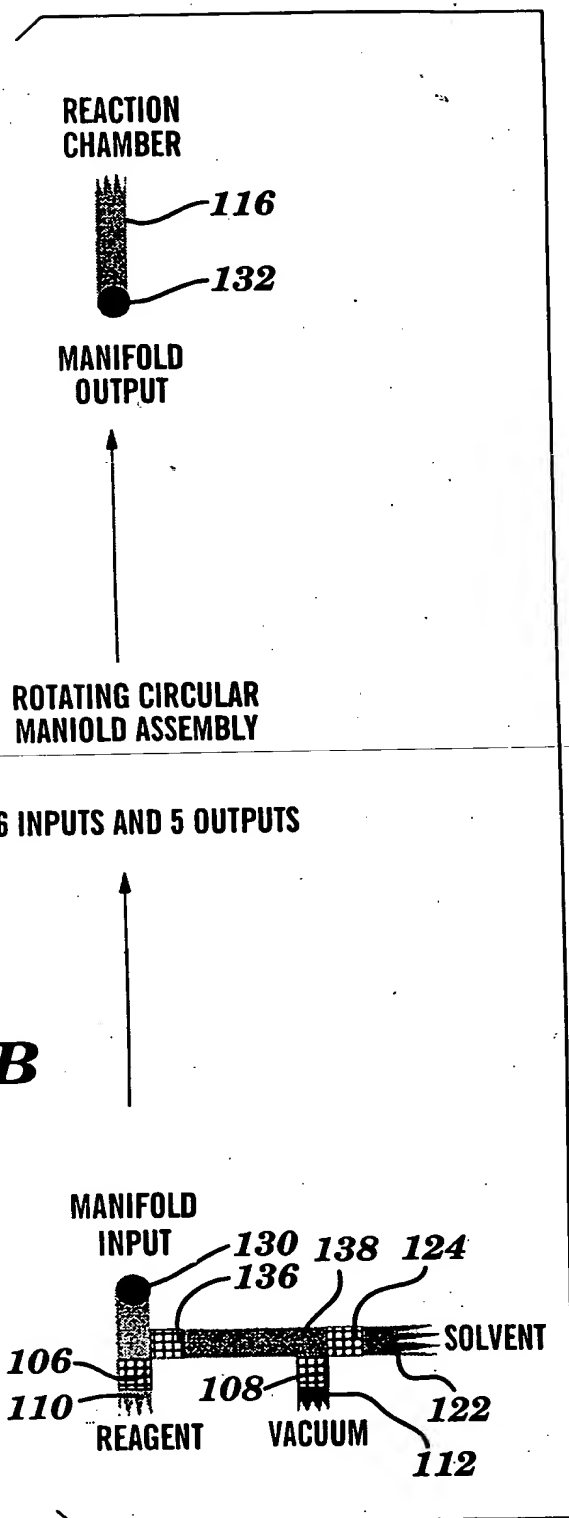
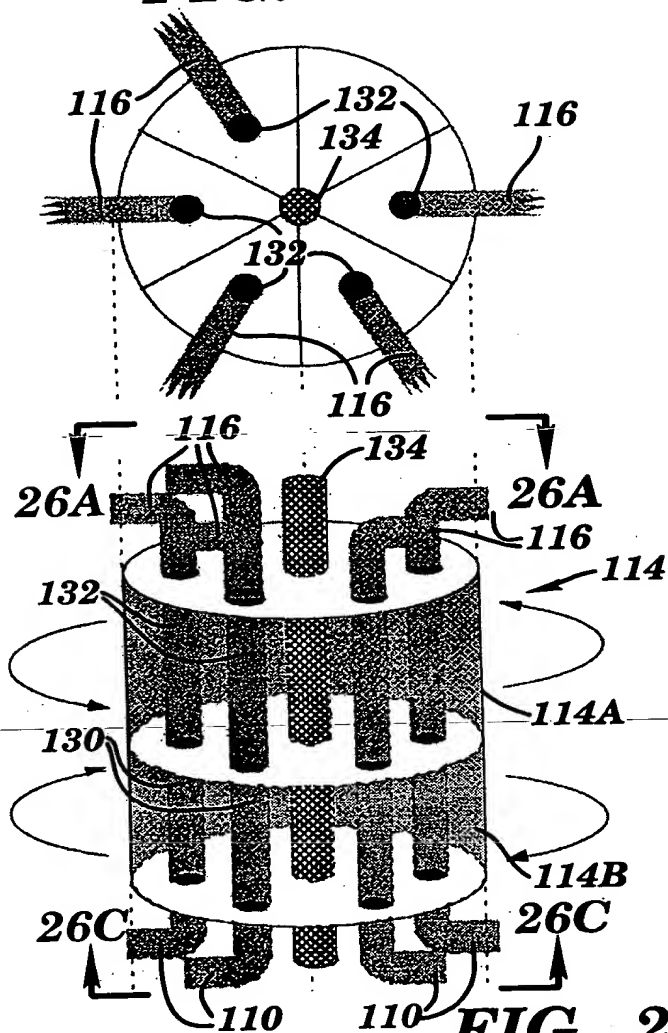


FIG. 26B

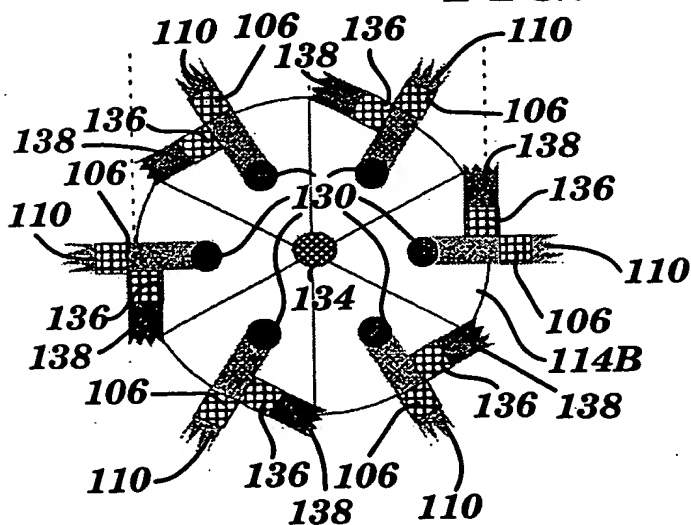


FIG. 26C

FIG. 26D

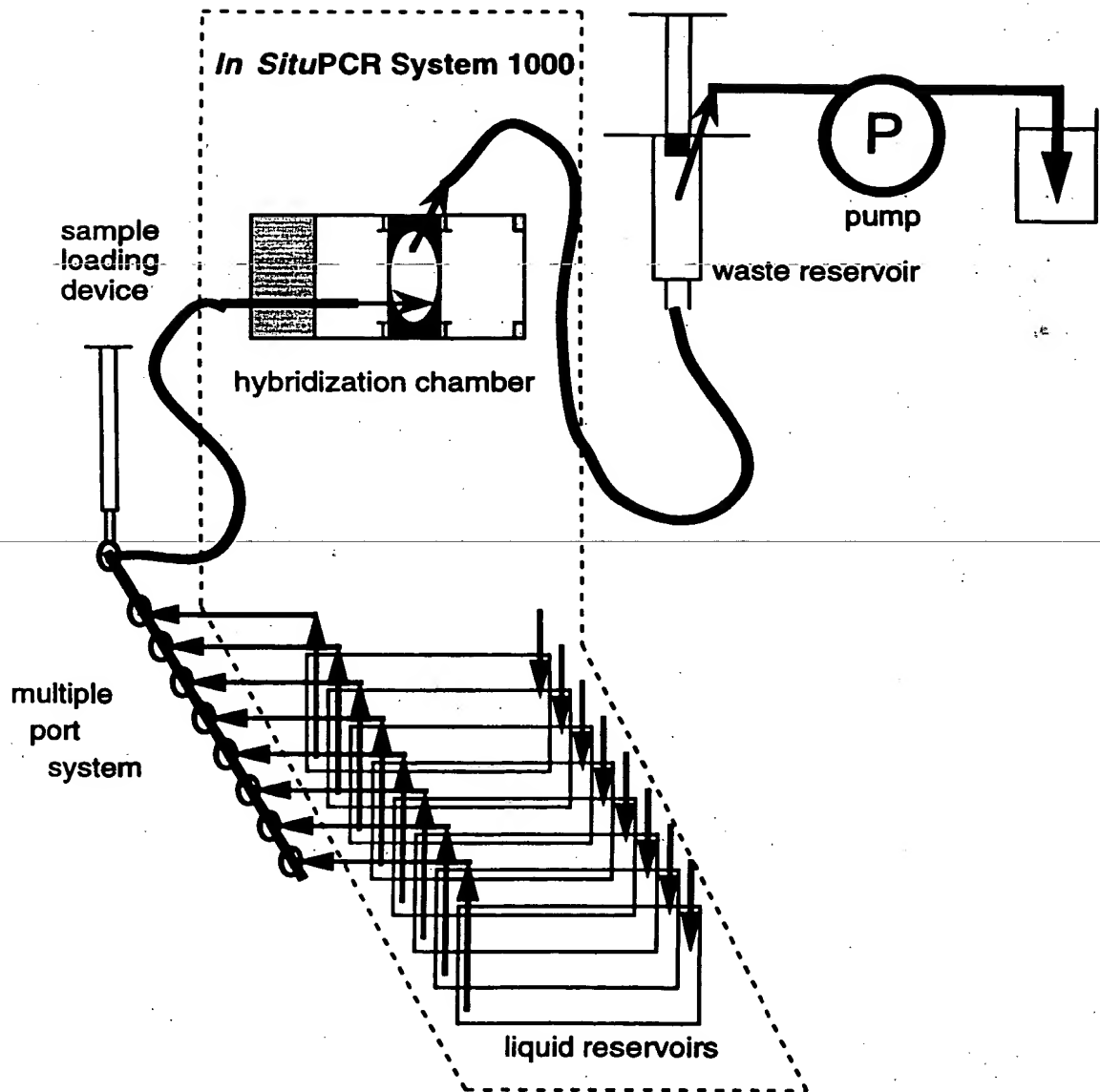


FIG. 27

28/34

-COOH; PROBE 12

-COOH; PROBE 14

-NH₂; PROBE 12

-NH₂; PROBE 14

FIG. 28

0908527 110904

29/34

2% EGDMA

2% HDDMA

4% EGDMA

FIG. 29

09085527.110901
FO50T" 42598060

30/34

1 ●
2 ●

FIG. 30

09986527.110901
106011.2598660

31/34

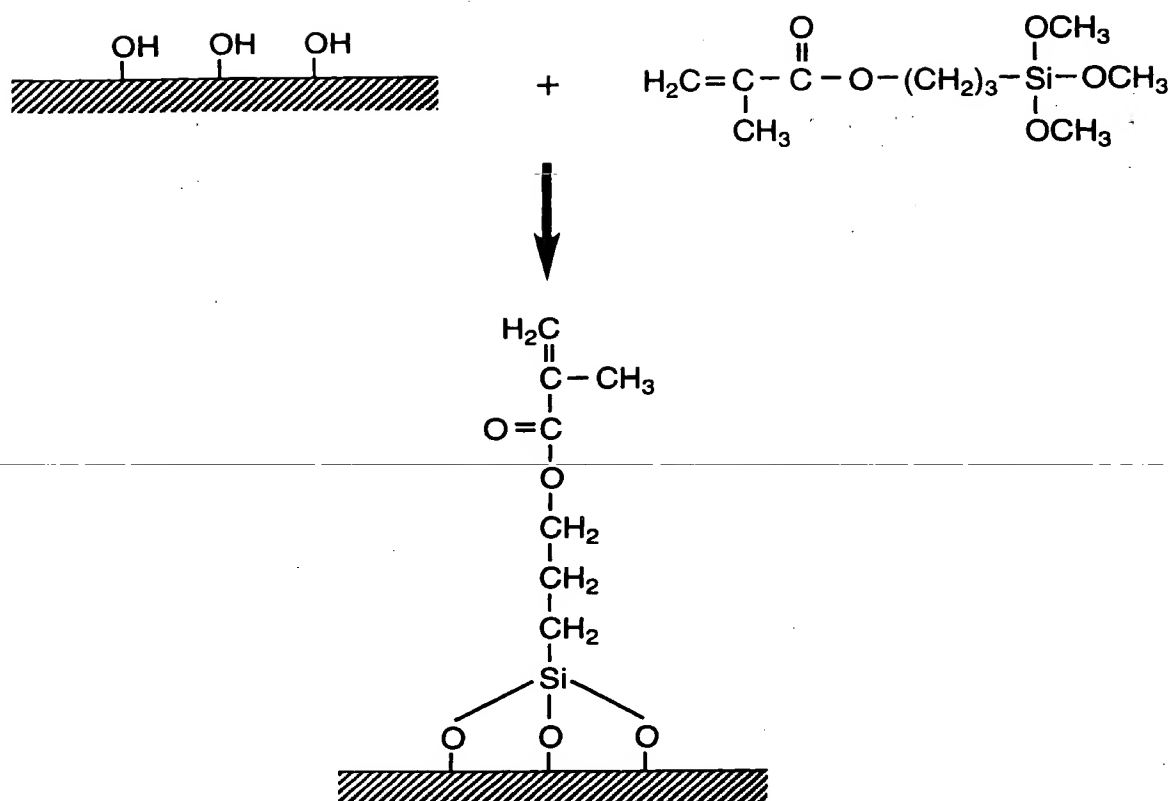


FIG. 31

32/34

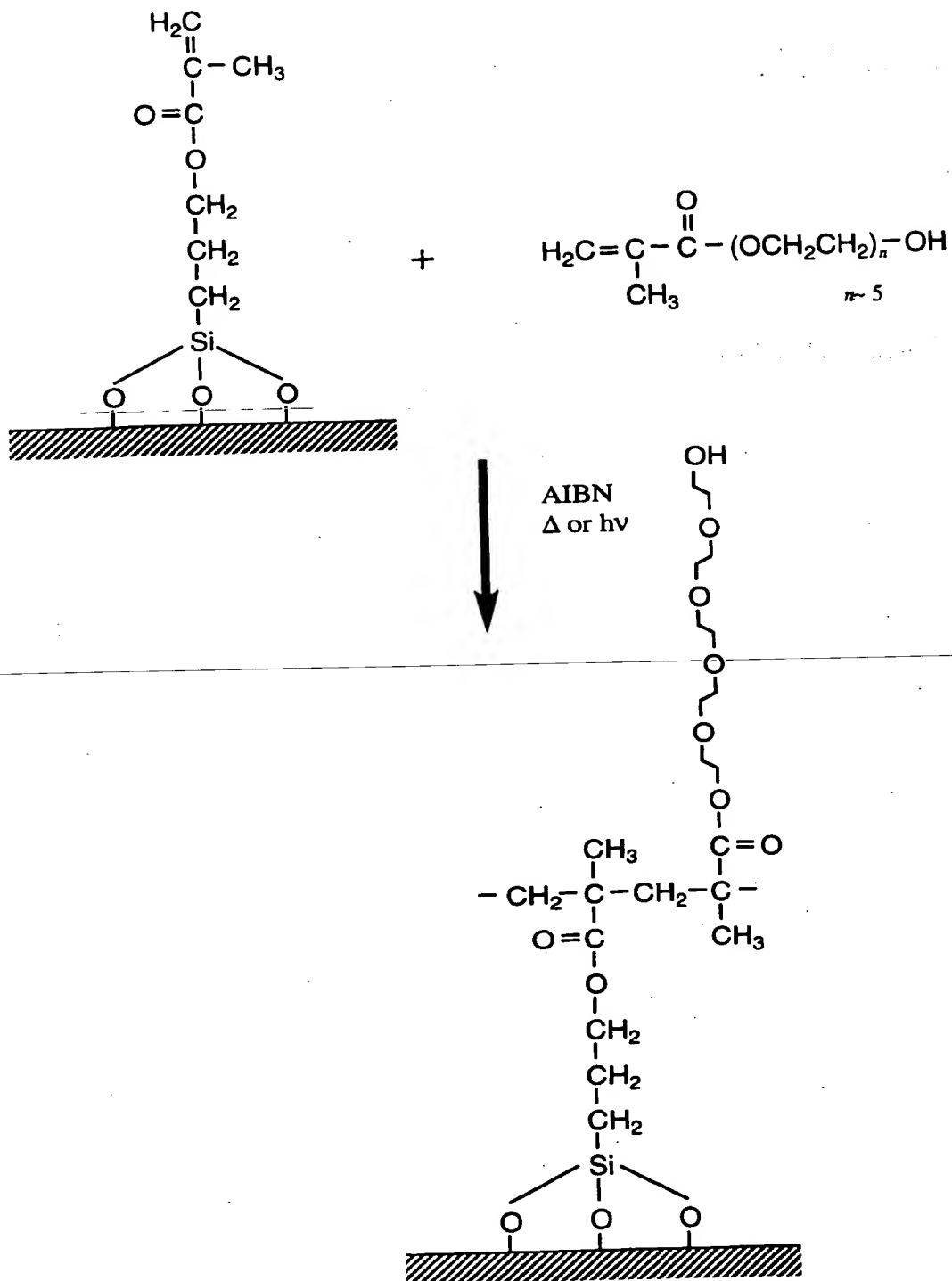


FIG. 32

33/34

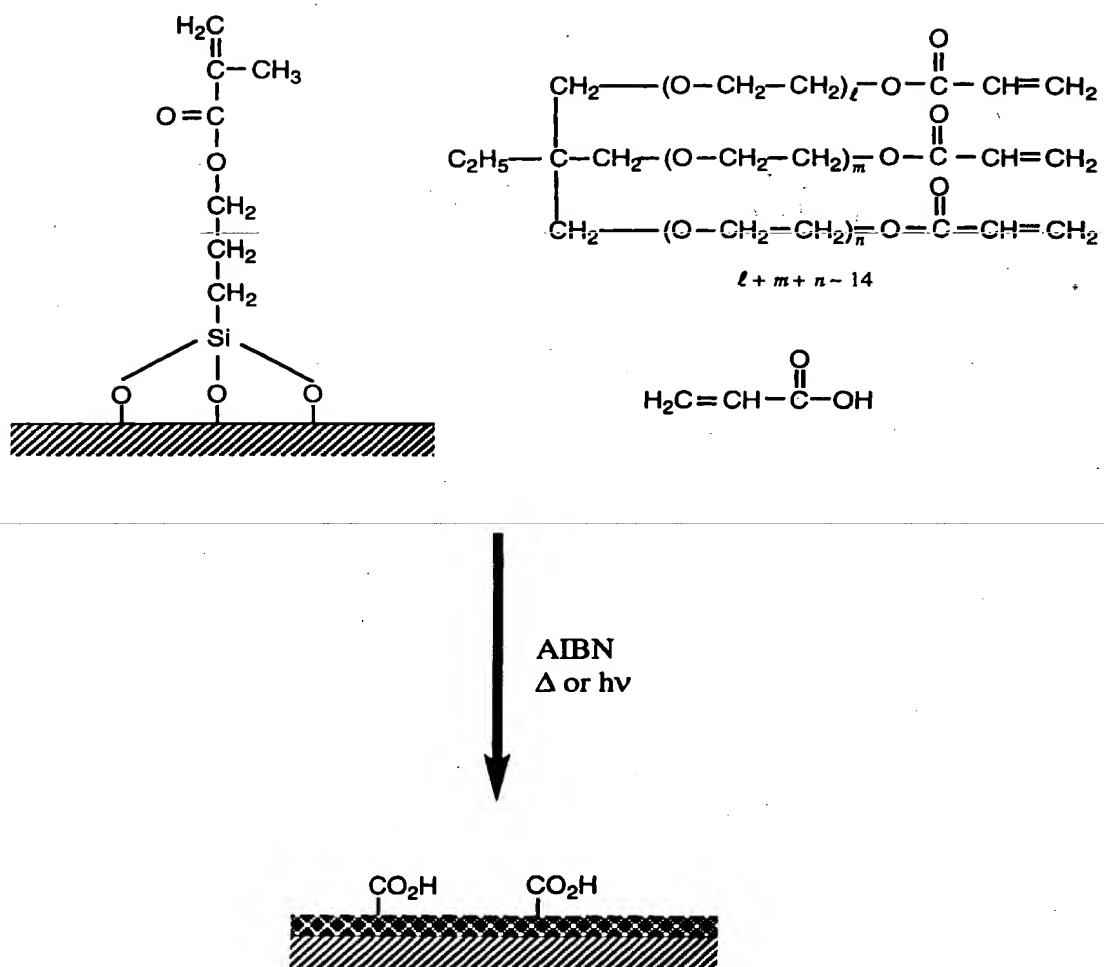


FIG. 33

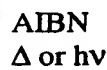


FIG. 34